(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **2001351976 A**

(43) Date of publication of application: **21.12.01**

(51) Int. Cl **H01L 21/768**
H01L 21/28
H01L 21/316
H01L 21/3205

(21) Application number: **2001117668**

(22) Date of filing: **17.04.01**

(30) Priority: **17.04.00 US 2000 550943**

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(54) **METHOD FOR PROTECTING LOW-PERMITTIVITY LAYER ON SEMICONDUCTOR MATERIAL**

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a permanent protection hard mask for protecting the dielectric characteristics of a main dielectric layer that has undesired low permittivity of a semiconductor device due to undesired increase in permittivity, undesired increase in current leakage, and a low device yield caused by surface scratch, when a continuous treatment processing is conducted..

SOLUTION: This protection hard mask has a one- or two-layer sacrificial hard mask that is especially effective, when interconnection structure such as a via opening and/or a line is formed between low-permittivity materials, while a final product is manufacture. The sacrificial and permanent hard masks are formed of the same precursor substance in a single process, where process conditions are changed for giving a film having different permittivity. Most preferably, dual damascene structure has three-layer hard masks 40, 50, and 60 that are formed on the inter-level dielectric with bulk low permittivity, before the interconnection structure of the inter-level dielectric is formed.